

Claims

- [1] A direct drive motor in a washing machine comprising:
a stator 14 having a winding portion with coils wound thereon;
a rotor having a sidewall 13b, and a rear wall 13a with a pass through hole 131 at a center,
an annular washer in close contact with, and fixedly secured to, the rear wall 13a of the rotor 13;
a connector of resin having a vibration mode different from the washing shaft, fixedly secured to the rear wall of the rotor for supporting the washing shaft;
coupling means for coupling the connector 16, the rotor 13, and the washer 30 together.
- [2] The direct drive motor as claimed in claim 1, wherein the rotor 13 is constructed of steel plate by pressing, to form the side wall 13b and the rear wall 13a as one body.
- [3] The direct drive motor as claimed in claim 1, wherein the rotor 13 has fastening pass through holes 138 around the pass through hole 131,
the washer 30 has fastening pass through holes 300a on a surface thereof in correspondence to the fastening pass through holes 138 in the rear wall of the rotor,
the connector has fastening pass through holes 162 in correspondence to the fastening pass through holes 138 in the rotor 13, and
the coupling means includes bolts 'B' inserted through the fastening pass through holes 162, 138, and 300a, and nuts 'N' fastened to threads on the bolts 'B' for holding the connector 16, rotor, and washer.
- [4] The direct drive motor as claimed in claim 1, wherein the annular washer 30 further includes positioning holes in which the positioning projections 160 on the connector 16 are placed respectively, separate from the fastening pass through holes 300a.
- [5] The direct drive motor as claimed in claim 4, wherein the positioning holes are formed along a circumferential direction of an imaginary circle having a diameter different from an imaginary circle connecting centers of the fastening pass through holes 300a in the annular washer 30.
- [6] The direct drive motor as claimed in claim 2, wherein the rotor 13 further includes a hub 132 projected from the rear wall toward the washing shaft for reinforcing strength, and providing a seating surface.

- [7] The direct drive motor as claimed in claim 6, wherein the annular washer 30 includes a bent portion 310 on a circumference having a shape in conformity with a shape of a bent portion of the hub 132.
- [8] The direct drive motor as claimed in claim 6, wherein the annular washer 30 is in close contact with, and fixedly secured to an outer side of the rear wall 13a of the rotor 13, and the connector 16 is mounted on an inner side of the rear wall 13a of the rotor 13.
- [9] A direct drive motor in a washing machine comprising:
a stator 14 having a winding portion with coils wound thereon;
a rotor having a sidewall 13b, and a rear wall 13a with a pass through hole 131 at a center, and fastening pass through holes 138 around the pass through hole 131;
an annular washer 30 in close contact with, and fixedly secured to, the rear wall 13a of the rotor 13, the annular washer 30 having fastening bosses 300 projected from a surface thereof toward a washing shaft in correspondence to fastening pass through holes 138 in the rear wall of the rotor, each of the fastening bosses 300 having a fastening hole 300b with a thread on an inside circumference;
a connector of resin having a vibration mode different from the washing shaft, fixedly secured to the rear wall of the rotor with bolts B passed through the fastening pass through holes 138 in the rotor, and fastened to the fastening bosses 300 on the annular washer 30.
- [10] The direct drive motor as claimed in claim 9, wherein the rotor 13 is constructed of steel plate by pressing, to form the side wall 13b and the rear wall 13a as one body.
- [11] The direct drive motor as claimed in claim 10, wherein the fastening bosses 300 on the annular washer 30 are in at least two lines in a circumferential direction as imaginary circles connecting centers of the fastening bosses 300 have diameters different from each other.
- [12] The direct drive motor as claimed in claim 10, wherein the annular washer 30 further includes positioning holes in which the positioning projections 160 on the connector 16 are placed respectively, separate from the fastening bosses 300.
- [13] The direct drive motor as claimed in claim 12, wherein the positioning holes are formed along a circumferential direction of an imaginary circle having a diameter different from an imaginary circle connecting centers of the fastening pass bosses 300 on the annular washer 30.
- [14] The direct drive motor as claimed in claim 10, wherein the rotor 13 further

- includes a hub 132 projected from the rear wall toward the washing shaft for reinforcing strength, and providing a seating surface.
- [15] The direct drive motor as claimed in claim 14, wherein the annular washer 30 includes a bent portion 310 on a circumference having a shape in conformity with a shape of a bent portion of the hub 132.
- [16] The direct drive motor as claimed in claim 14, wherein the annular washer 30 is in close contact with, and fixedly secured to an outer side of the rear wall 13a of the rotor 13, and the connector 16 is mounted on an inner side of the rear wall 13a of the rotor 13.
- [17] A direct drive motor in a washing machine comprising:
a stator 14 having a winding portion with coils wound thereon;
a rotor having a sidewall 13b, and a rear wall 13a with a pass through hole 131 at a center, and fastening pass through holes 138 around the pass through hole 131;
a connector 16 of resin having a vibration mode different from the washing shaft, fixedly secured to an inner side of the rear wall of the rotor for supporting the washing shaft, the connector having fastening pass through holes 162 in correspondence to the fastening pass through holes 138 around the pass through hole 131;
an annular washer 30 in close contact with an outer side of, and fixedly secured to, the rear wall 13a of the rotor 13, the annular washer 30 having fastening pass through holes 300a in a surface thereof in correspondence to the fastening pass through holes 138 in the rear wall of the rotor, and positioning holes in which the positioning projections 160 on the connector 16 are inserted; and
coupling means for coupling the connector 16, the rotor 13, and the washer 30.
- [18] The direct drive motor as claimed in claim 17, wherein the rotor 13 further includes a hub 132 projected from the rear wall toward the washing shaft for reinforcing strength, and providing a seating surface.
- [19] The direct drive motor as claimed in claim 18, wherein the positioning holes are formed along a circumferential direction of an imaginary circle having a diameter different from an imaginary circle connecting centers of the fastening pass through holes 300a in the annular washer 30.
- [20] The direct drive motor as claimed in claim 19, wherein the annular washer 30 includes a bent portion 310 on a circumference having a shape in conformity with a shape of a bent portion of the hub 132.